METHOD FOR CORRECTING MASK
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Attorney Docket No.: 075834.00464
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FIG. 1

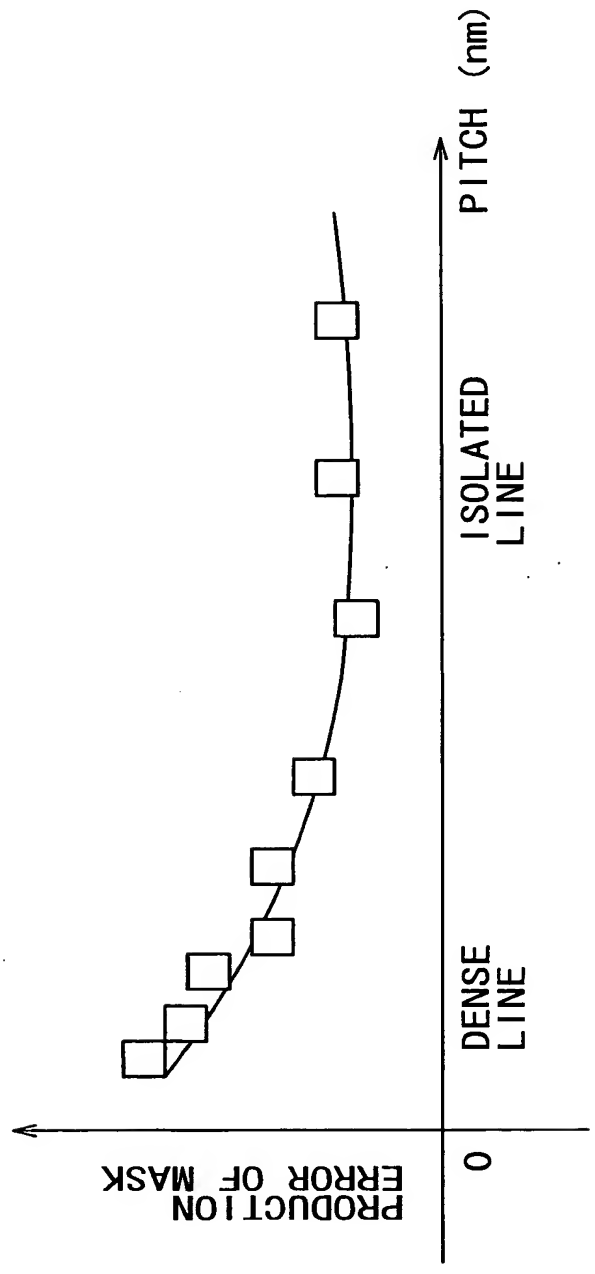


FIG. 2

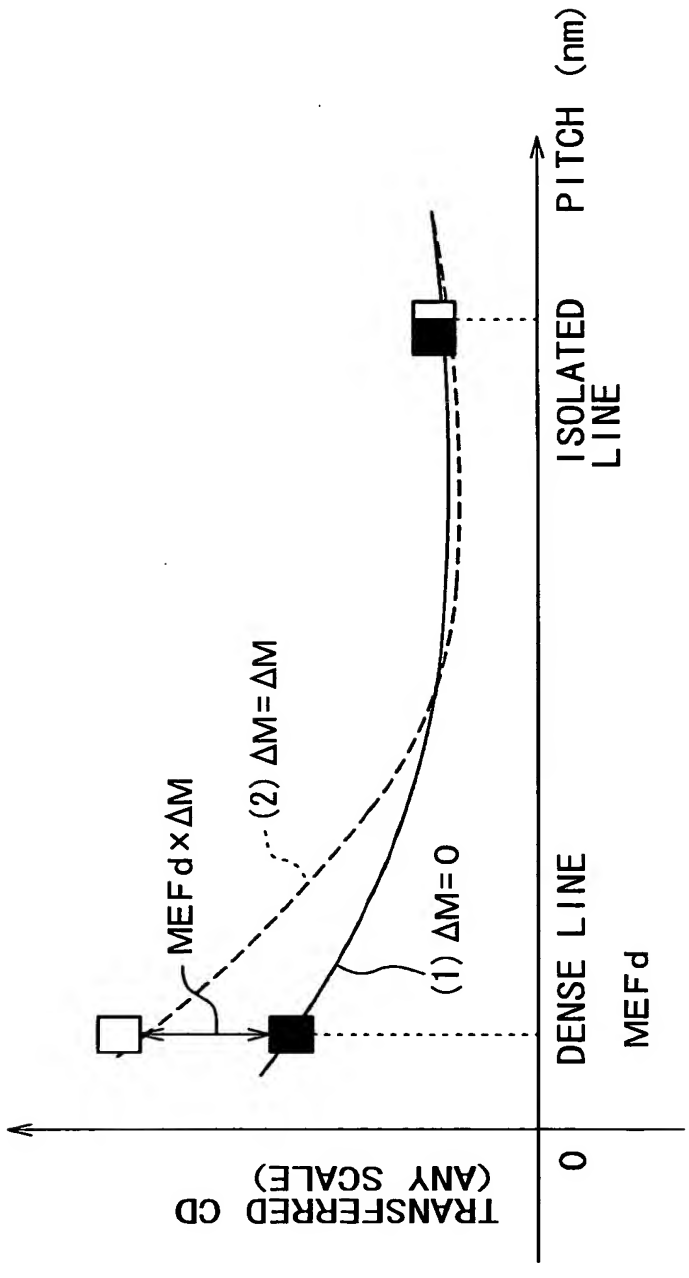

PITCH (nm)
ISOLATED LINE
DENSE LINE
MEFd
0
TRANSFERRED CD (ANY SCALE)
MEFd×ΔM
(2) ΔM=ΔM
(1) ΔM=0

FIG. 3

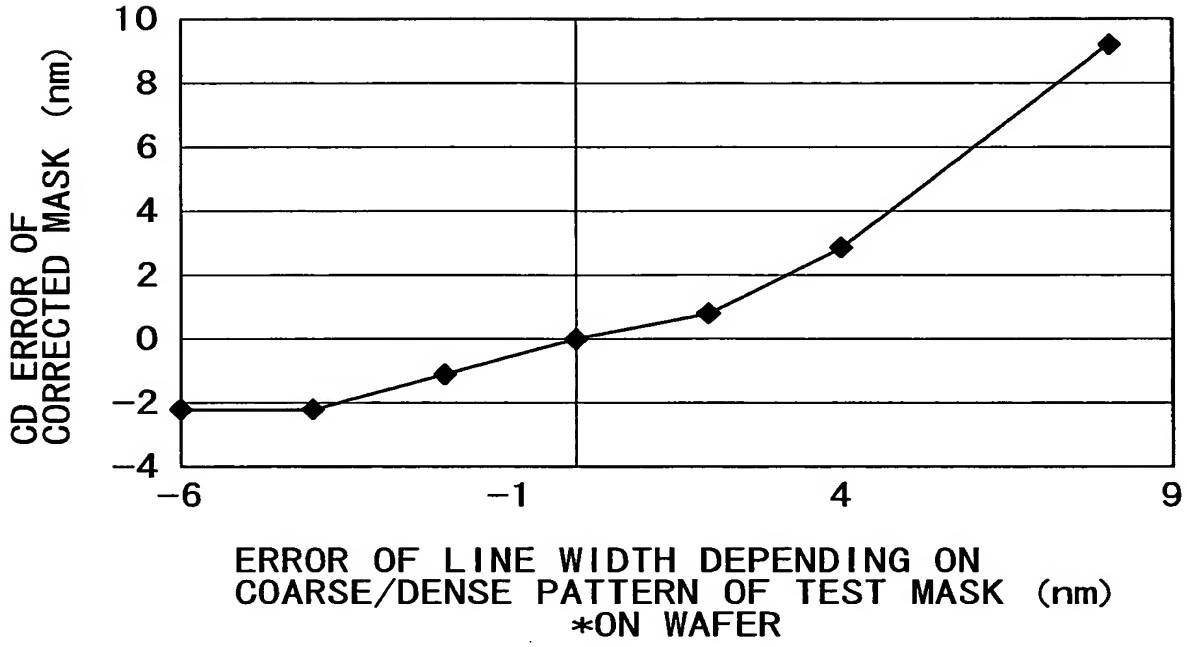


FIG. 4

DIMENSIONAL ERROR OF COARSE/DENSE MASK (ON W)	CALCULATED CORRECTED VALUE OF MASK	DIMENSIONS OF CORRECTED MASK (WHEN ERROR DEPENDING ON COARSE/DENSE IS REPRODUCED)	CD ERROR OF WAFER CD WHEN CORRECTED MASK IS TRANSFERRED
−6	132	126	−2.2
−4	130	126	−2.2
−2	128.5	126.5	−1.2
0	127	127	0
2	125.5	127.5	0.8
4	124.5	128.5	2.9
8	123.5	131.5	9.2

FIG. 5

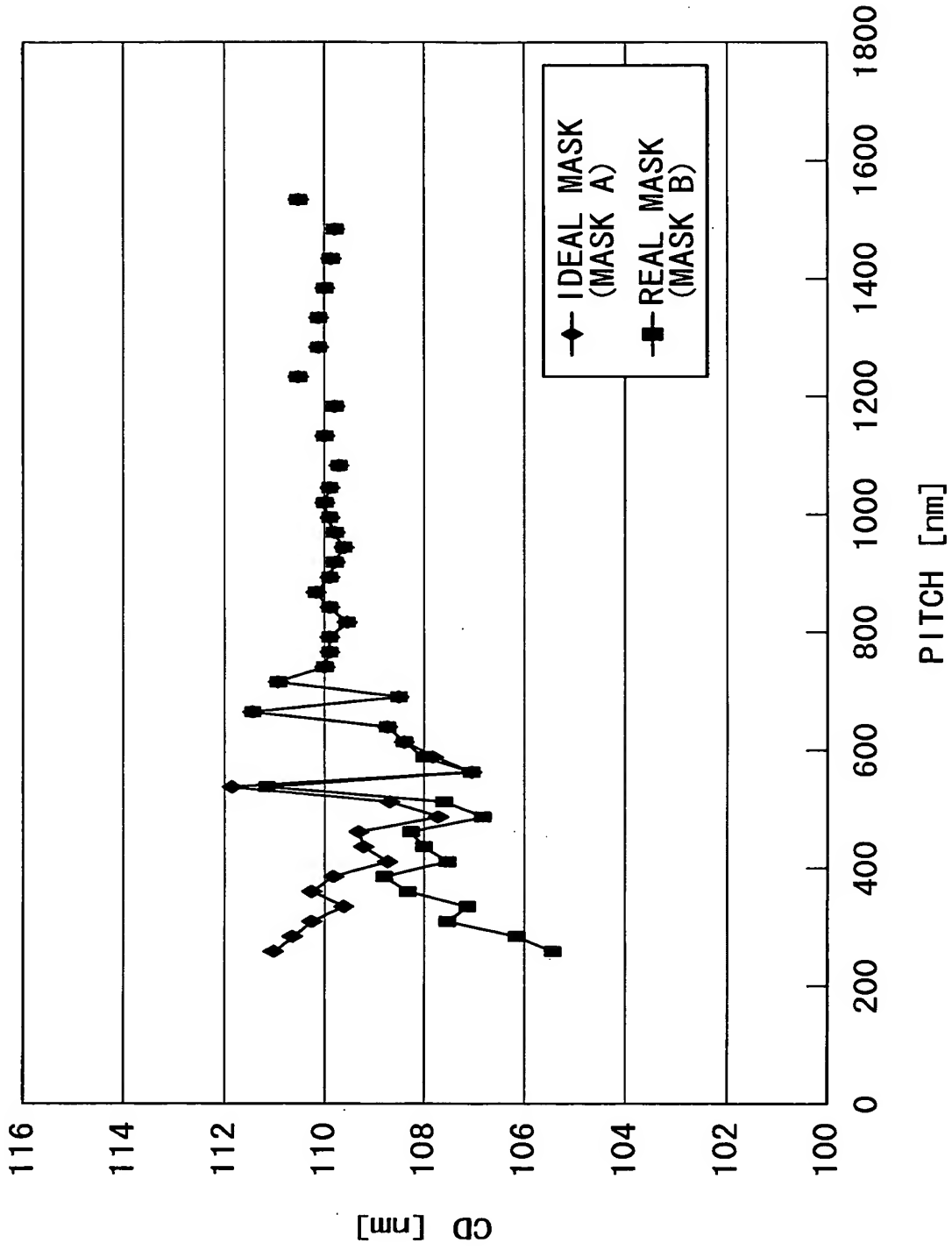

IDEAL MASK (MASK A)
REAL MASK (MASK B)
CD [nm]
116
114
112
110
108
106
104
102
100
0
200
400
600
800
1000
1200
1400
1600
1800
PITCH [nm]

FIG. 6

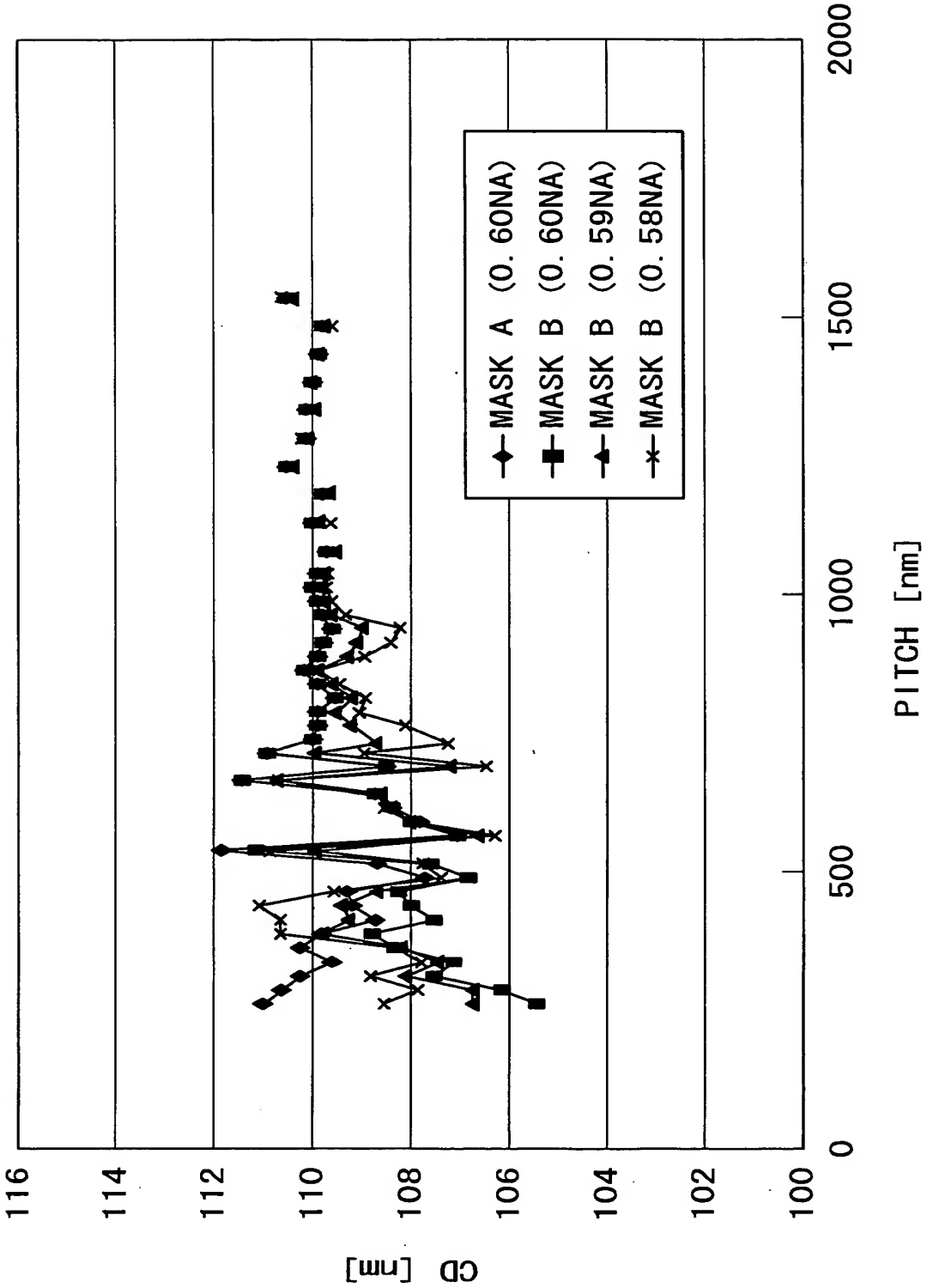

MASK A (0.60NA)
MASK B (0.60NA)
MASK B (0.59NA)
MASK B (0.58NA)
CD [nm]
116
114
112
110
108
106
104
102
100
0
500
1000
1500
2000
PITCH [nm]

FIG. 7

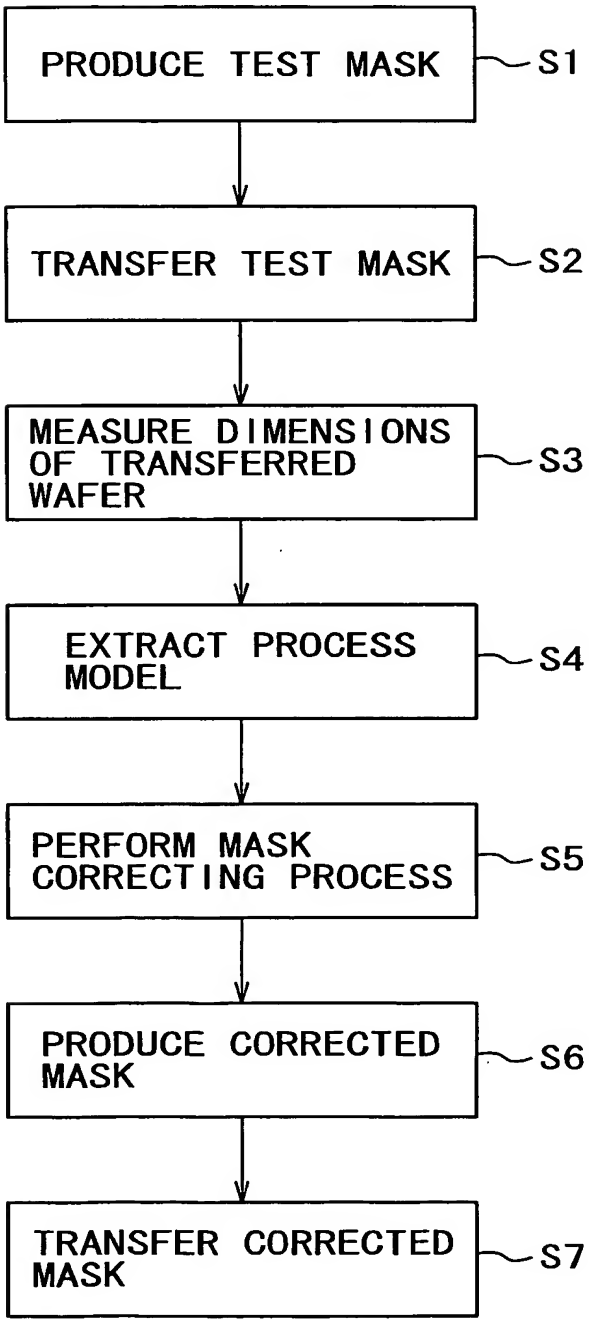

PRODUCE TEST MASK
S1
TRANSFER TEST MASK
S2
MEASURE DIMENSIONS OF TRANSFERRED WAFER
S3
EXTRACT PROCESS MODEL
S4
PERFORM MASK CORRECTING PROCESS
S5
PRODUCE CORRECTED MASK
S6
TRANSFER CORRECTED MASK
S7

FIG. 8

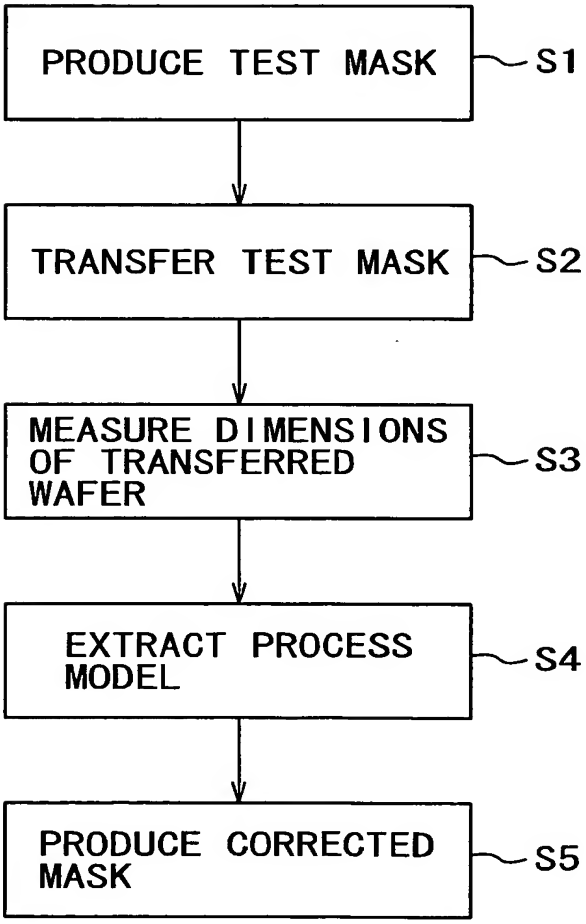

PRODUCE TEST MASK
S1
TRANSFER TEST MASK
S2
MEASURE DIMENSIONS OF TRANSFERRED WAFER
S3
EXTRACT PROCESS MODEL
S4
PRODUCE CORRECTED MASK
S5

FIG. 9

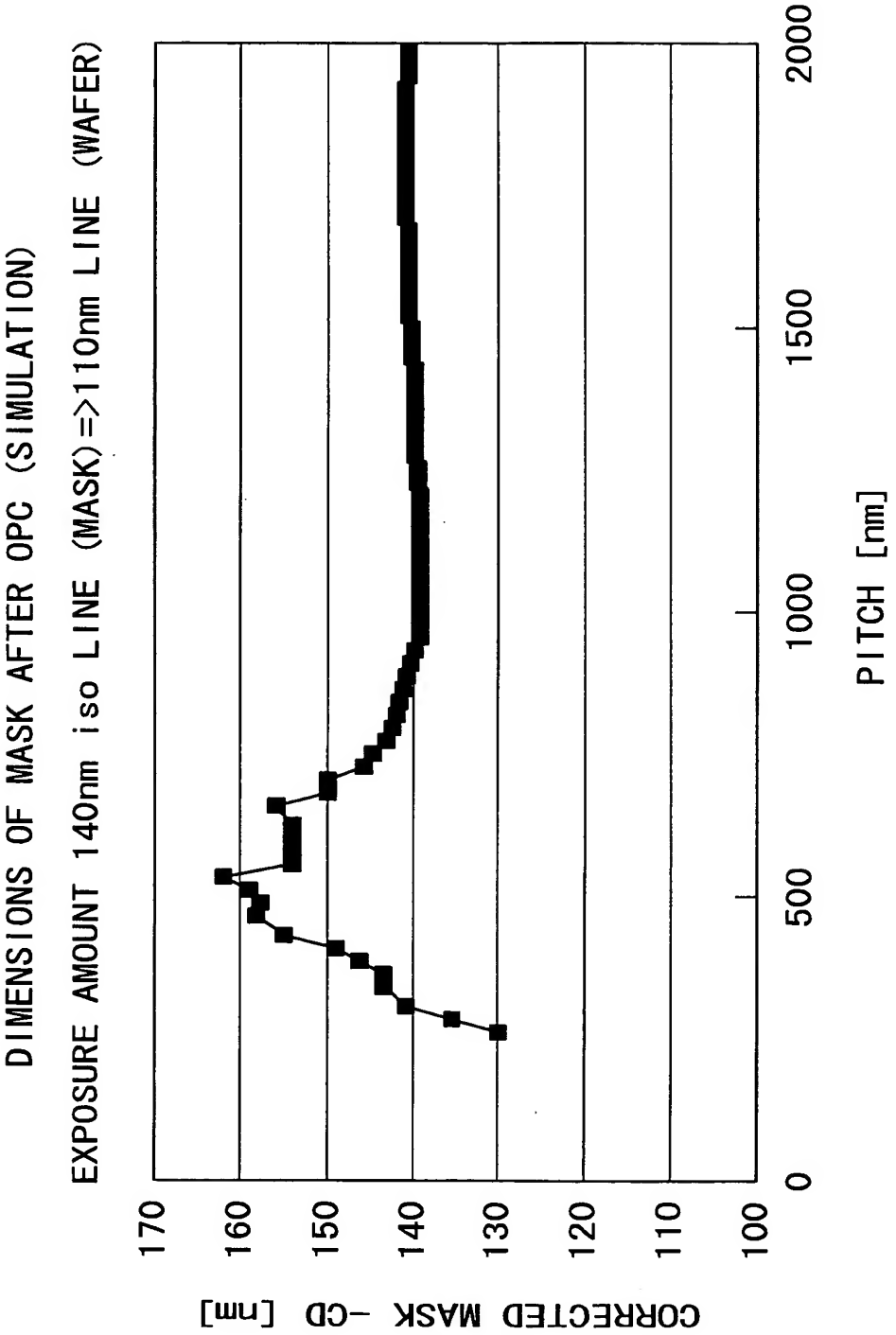
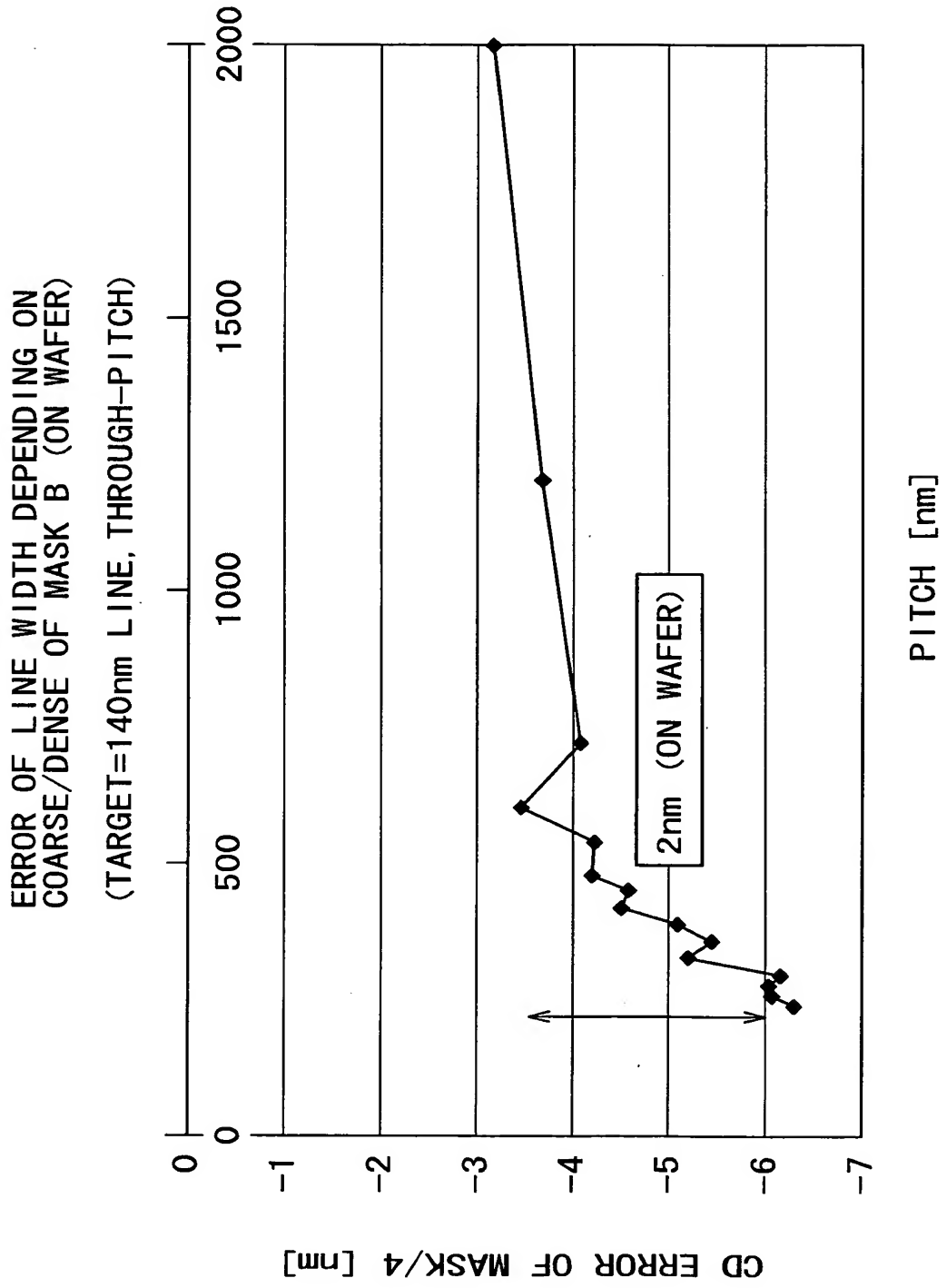

DIMENSIONS OF MASK AFTER OPC (SIMULATION)
EXPOSURE AMOUNT 140nm iso LINE (MASK)=>110nm LINE (WAFER)
CORRECTED MASK -CD [nm]
170
160
150
140
130
120
110
100
0
500
1000
1500
2000
PITCH [nm]

FIG. 10


ERROR OF LINE WIDTH DEPENDING ON COARSE/DENSE OF MASK B (ON WAFER)
(TARGET=140nm LINE, THROUGH-PITCH)
CD ERROR OF MASK/4 [nm]
PITCH [nm]
0
500
1000
1500
2000
-1
-2
-3
-4
-5
-6
-7
2nm (ON WAFER)